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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/943,487	08/30/2001	Yakov Epshteyn	SFI 718D1	9680

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EXAMINER

TRAN, BINH X

ART UNIT	PAPER NUMBER
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1765

DATE MAILED: 04/29/2003

6

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/943,487

Applicant(s)

EPSHTEYN ET AL.

Examiner

Binh X Tran

Art Unit

1765

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 April 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 8-21 and 23-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 8-21 and 23-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

2. Claims 8-12 are rejected under 35 U.S.C. 102(e) as being anticipated by Yu et al. (US 6,165,052).

Yu teaches a method for processing a surface of a semiconductor wafer comprising the steps of:

removing the material (220) overlying the barrier layer (215) from the wafer surface at a first polishing station (i.e. primary polishing station) with a first polishing pad (primary polishing pad) (col. 6, specific col. 6 lines 45-49, step 300 of Fig 3);

removing the barrier layer from the wafer surface at a second station (read on buff station) using a set of second station parameters (col. 6, step 320 of Fig 3).

Respect to claim 9, Yu discloses a step of buffing the wafer surface after the barrier layer removal (col. 6 lines line 51-53, step 330 of Fig 3). Respect to claim 10, Yu discloses the set of second station parameters (buff station parameter) is different for the barrier removal step than for the buffing step. Respect to claim 11, Yu discloses a different slurry composition is used for the barrier removal step (step 320) than for the buffing step (step 330). Respect to claim 12, Yu discloses the step of detecting when the material layer is substantially removed from the wafer surface (step 310).

3. Claims 8-14, 23-25 are rejected under 35 U.S.C. 102(e) as being anticipated by Easter et al. (US 6,368,955).

Easter teaches a method for processing a surface of a semiconductor wafer comprising the steps of:

removing the material (16) overlying the barrier layer (liner 14) from the wafer surface at a first polishing station (i.e. primary polishing station) with a first polishing pad (primary polishing pad) (col. 4 line 65 col. 5 lines 30);

removing the barrier layer (14) from the wafer surface at a second station (read on buff station) using a set of second station parameters (col. 5 lines 59-67).

Respect to claim 9, Easter discloses a step of buffing the wafer surface after the barrier layer (14) removal (col. 6 lines 1-7). Respect to claim 10, Easter discloses the set of second station parameters (read on buff station parameter) is different for the barrier removal step than for the buffing step. Respect to claim 11, Easter discloses a different slurry composition is used for the barrier removal step (i.e., second polishing step) than for the buffing step. Respect to claim 12, Easter discloses the step of

Art Unit: 1765

detecting when the material layer is substantially removed from the wafer surface (col. 5 lines 31-44). Respect to claim 13-14, Easter discloses the step of detecting a point at which the barrier layer (liner 14) removal is substantially complete using endpoint detection system (col. 5 lines 60-67). Respect to claims 23-24, Easter discloses the material (16) is comprised of copper and the barrier layer (liner 14) is comprised of Ta or TaN (col. 6 lines 9-11). Respect to claim 25, Easter discloses supplying a first polishing slurry to the first polishing station (read on "primary polishing station") and supplying a different polishing slurry to the second station (read on "buff station") (col. 6-7).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 15, 17, 19, 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Easter in view of Somekh (Us 5,897,426).

Respect to claims 15 and 17, Easter fails to disclose the endpoint detection system is comprise of an optical and/or laser detection system. However, Easter clearly discloses the use of the endpoint detection system. In a semiconductor method, Somekh discloses the use of the laser endpoint detection system (col. 4 lines 36-48). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Easter in view of Somekh by using the optical or laser detection system

because equivalent and substitution of one for the other would produce an expected result.

Respect to claim 19, Easter fails to disclose the step of conditioning the buff station pads. Somekh discloses the step of conditioning the pad (col. 3 lines 11-17). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Easter in view of Somekh by conditioning the pad because it will maintain the pad so that it will effectively remove any material from the substrate. Respect to claim 21, Somekh discloses the conditioning step is accomplished by pressing the lower pad (30) against the upper pad and rotating each pad at different velocity (col. 3 lines 11-17, Fig 1).

6. Claims 19, 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Easter in view of Woo (US 5,816,891).

Respect to claim 19, Easter fails to disclose the step of conditioning the buff station pads. Woo discloses the step of conditioning the pad (col. 7 lines 35-56). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Easter in view of Woo by conditioning the pad because it will maintain the pad so that it will effectively remove any material from the substrate. Respect to claim 21, Woo discloses the pad-conditioning step is performed between wafer(s) being processed (col. 7 lines 35-56).

7. Claims 15-16, 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Easter in view of Mikhaylich et al. (US 6,375,540).

Respect to claims 15-16, Easter fails to disclose the endpoint detection system is comprises of an optical and/or infra red detection system. However, Easter clearly discloses the use of the endpoint detection system. In a semiconductor method, Mikhaylich discloses the use of the infra red detection system (col. 7 lines 41-57). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Easter in view of Mikhaylich by using the optical and/or infra red detection system because equivalent and substitution of one for the other would produce an expected result.

Respect to claim 19, Easter fails to disclose the step of conditioning the buff station pads. Mikhaylich discloses the step of conditioning the pad (col. 6 lines 38-45). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Easter in view of Mikhaylich by conditioning the pad because it will maintain the pad so that it will effectively remove any material from the substrate.

Respect to claim 20, Mikhaylich discloses the conditioning step is accomplished by pressing the lower pad against the upper pad and rotating each pad at different velocity (col. 6 lines 38-45). Respect to claim 21, Mikhaylich discloses that the conditioning step is performed ex-situ manner (read on "performed between wafers being processed" col. 6 lines 40-45).

8. Claims 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Easter (US 6,368,955) in view of Easter (US 6,254,454).

Easter ('955) fails to disclose the endpoint detection system is comprises of motor current detection system. However, Easter ('955) clearly discloses the use of the

Art Unit: 1765

endpoint detection system. In a semiconductor method, Easter ('454) discloses the use of the motor current detection system. It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Easter ('955) in view of Easter ('454) by using the motor current detection system because equivalent and substitution of one for the other would produce an expected result.

Response to Arguments

9. Applicant's argument filed 4-22-2003 have been fully considered but they are not persuasive. According to applicants, "the primary polishing station" and the "buff station" are not the same as defined in the paragraphs of page 10. Applicants argue that Yu fails to disclose a buff station. According to applicants, Yu only disclose multiple polishing stations. The examiner disagrees. The examiner recognizes that the applicants defined that "the term buff pad and buffing as used herein are generically defined a mean to a material removing article excluding a primary polishing step" (emphasis added). However, the examiner interprets the term "primary" means first or highest in rank, quality, or importance. Therefore, the examiner interpret that the first polishing step at the first polishing station using the first polishing pad read on the limitation of removing a material at primary polishing station with a primary polishing pad. Any polishing (or removing) steps and/or polishing stations use after the first polishing step or polishing station certainly are not the same with the primary polishing step and/or primary polishing station. Further, Yu clearly discloses the buffing step (col. 6 lines 50-52)

Respect to claims 8-14 and 23-25, the applicants further argues that "Easter reference may not be a proper reference under 35 U.S.C 102(e). The present application claims priority from a divisional application and a continuation in part having a priory date of October 8, 1999, more than a month before the filing date of the Easter reference." The examiner disagrees. The examiner acknowledges the priory claim of divisional application as well as a continuation in part application. However, the MPEP section 2133.01 states, "When applicant files a continuation-in-part whose claims are not supported by the parent application, the effective filing date is the filing date of the child CIP". Since the present claims are not properly support by the parent application (09/415,898 filed 10/08/1999), the effective filing date of this application is 12/13/2000, which is the filing date of the divisional. The examiner, therefore, maintains that Easter reference is a proper reference under 35 U.S. C 102(e).

The applicants further argue that Easter fails to disclose the "buffing station". According to applicants Easter only disclose the use of "second station" not "buffing station". The examiner disagrees. The response to this argument has been discussed above under Yu reference. Further, in col. 6 lines 2-6, Easter ('955) clearly discloses "Touch-up or buffing is well known in the art and is employed to remove residual liner film material...other defects from the surface of the dielectric".

Conclusion

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

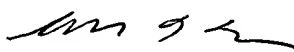
Art Unit: 1765

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Binh X Tran whose telephone number is (703) 308-1867. The examiner can normally be reached on Monday-Thursday and every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benjamin L Utech can be reached on (703) 308-3836. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Binh X. Tran
April 25, 2003


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